REMARKS

Claims 1 to 14 were pending in the above-identified application. Applicant has amended claims 1, 4, 6, and 11. Claims 1 to 14 remain pending.

§ 101 Rejections

The Examiner rejected claims 1 to 14 under 35 U.S.C. § 101 as being directed to non-statutory subject matter.

Applicant has amended independent claim 1 to recite a "computer readable medium encoded with a snapshot tree structure" pursuant to MPEP § 2106 IV (B) (1) (a).

Applicant has amended independent claim 6 to recite a "method for storing snapshots that provide point-in-time backups of a base volume using a snapshot tree structure" in order to provide a practical application in the technological arts pursuant to MEPE § 2106 IV (B) (2) (b) (ii).

Similarly, Applicant has amended independent claim 11 to recite a "method for retrieving a point-in-time backup of a base volume by reading a value of a data block from a snapshot tree structure having the base volume" in order to provide a practical application in the technological arts pursuant to MEPE § 2106 IV (B) (2) (b) (ii).

Applicant respectfully requests the Examiner to withdraw the § 101 rejections.

§ 102 Rejections

The Examiner rejected claims 1 to 14 under 35 U.S.C. § 102(b) as being anticipated by the reference "File System Design for an NFS File Server Appliance" by Dave Hitz et al. (hereafter "Hitz et al.").

Claim 1

Addressing claim 1, the Examiner found:

> With respect to claim 1, Hitz teaches a snapshot tree structure (Figure 2), comprising:
>
> A first branch (Figure 3C), comprising:

> A base volume storing a current user data (page 5, Introduction, paragraph 5);
>
> A first read-only snapshot descending from the base volume (Figure 4 and corresponding text), the first read-only snapshot being created at a first time, the first read-only snapshot storing a first data of the base volume at the first time before the first data is modified in the base volume (Figure 3b, paragraph 3.4; create new snapshot by making duplicate copy of the root inode); and
>
> A second read-only snapshot descending form the first snapshot, the second read-only snapshot being created at a second time earlier than the first time, the second read-only snapshot storing a second data of the base volume at the second time before the second data is modified in the base volume (Figure 4 and corresponding text; contents are written to a new location).

March 27, 2006 Office Action, p. 4. Applicant respectfully traverses.

The Examiner cited Figs. 3(b) and 4 and their corresponding text in Hitz et al. for disclosing a first snapshot descending from a base volume and a second snapshot descending from the first snapshot. However, Figs. 3(a), 3(b), and 3(c) only illustrate the creation of a single snapshot and what happens to that snapshot after one of the blocks in the file system is updated.

> Figure 3(b) shows how WAFL creates a new Snapshot by making a duplicate copy of the root inode. This duplicate inode becomes the root of a tree of blocks representing the Snapshot, just as the root inode represents the active file system. When the Snapshot inode is created, it points to exactly the same disk blocks as the root inode, so a brand new Snapshot consumes no disk space ecept for the Snapshot inode itself.
>
> Figure 3(c) shows what happens when a user modifies data block D. WAFL writes the new data to block D' on disk, and changes the active file system to point to the new block. The Snapshot still references the original block D which is unmodified on disk. Over time, as files in the active file system are modified or deleted, the Snapshot references more and more blocks that are no longer used in the active file system. The rate at which files change determines how long Snapshots can be kept on line before they consume an unacceptable amount of disk space.

Hitz et al., p. 10 (emphasis added). Similarly, Figs. 4(a) and 4(b) illustrate the details of what happens to the snapshot after one of the blocks in the file system is updated.

> Figure 4 shows the transition from Figure 3(b) to 3(c) in more detail. When a disk block is modified, and its contents are written to a new location, the block's parent must be modified to reflect the new location. The parent's parent, in turn, must also be written to a new location, and so on up to the root of the tree.

Hitz et al., p. 11 (emphasis added). The Examiner may have confused the indirect blocks of the WAFL (Write Anywhere File Layout) file system with snapshots that descent from other snapshots. However, the indirect blocks point to data blocks or to other indirect blocks that point to data blocks, and the sum of the indirect blocks and the data blocks form the file system (e.g., a single volume or a single snapshot).

> .... WAFL is a block-based file system that uses inodes to describe files. It uses 4 KB blocks with no fragments.
>
> Each WAFL inode contains 16 block pointers to indicate which blocks belong to the file. Unlike FFS, all the block pointers in a WAFL inode refer to blocks at the same level. Thus, inodes for files smaller than 64 KB use the 16 block pointers to point to data blocks. Inodes for files smaller than 64 MB point to indirect blocks which point to actual file data. Inodes for larger files point to doubly indirect blocks. For very small files, data is stored in the inode itself in place of the block pointers.

Hitz et al., p. 3. Thus, amended claim 1 is patentable over Hitz et al. because Hitz et al. does not disclose a snapshot tree structure having a first snapshot that descends from a base volume and a second snapshot that descends from the first snapshot.

Claims 2 to 5

Claims 2 to 5 depend from amended claim 1 and are patentable over Hitz et al. for at least the same reasons as amended claim 1.

Claim 6

Amended claim 6 is a method claim that parallels amended apparatus claim 1. Thus, amended claim 6 is patentable over Hitz et al. for at least the same reasons as amended claim 1.

Claims 7 to 10

Claims 7 to 10 depend from amended claim 6 and are patentable over Hitz et al. for at least the same reasons as amended claim 6.

Claim 11

Amended claim 11 recites searching for a data block in a second snapshot, which descends from a first snapshot, which descends from a base volume, and, if the data block is not in the second snapshot, searching for the data block in the first snapshot. As described above, Hitz et al. does not

disclose a snapshot tree structure having a first snapshot that descends from a base volume and a second snapshot that descends from the first snapshot. Accordingly, amended claim 11 is patentable over Hitz et al.

Claims 12 to 14

Claims 12 to 14 depend from amended claim 11 and are patentable over Hitz et al. for at least the same reasons as amended claim 11.

Summary

Claims 1 to 14 were pending in the above-identified application when last examined. Applicant has amended claims 1, 4, 6, and 11. For the above reasons, Applicant respectfully requests the Examiner to withdraw the claim rejections and allow claims 1 to 14. Should the Examiner have any questions, please call the undersigned at (408) 382-0480x206.

Respectfully submitted,

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